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Differences in Student Perceptions with Virtual Clinical Simulation

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DIFFERENCES IN STUDENT PERCEPTIONS WITH VIRTUAL CLINICAL SIMULATION

A DNP Project Submitted to the
Graduate Faculty
of Jacksonville State University
in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Nursing Practice

By

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ABSTRACT

Background: Simulation has been a part of nursing education since its inception, with virtual clinical simulation gaining expanded use since the Coronavirus Pandemic. Once considered only a supplemental teaching method, this form of education has become an imperative means of program progression for nursing students when hospital clinical spaces are limited.

Purpose: The purpose of the study is to evaluate potential differences in nursing student perceptions of anxiety and self-confidence with clinical decision making in virtual clinical simulation compared to traditional face-to-face clinicals.

Design Methods: A descriptive, quantitative study using the NASC-CDM© tool completed by 5th (final) semester nursing students was analyzed using a series of paired t-tests. The 27-item post-test survey was completed after both virtual clinical simulation sessions and traditional face-to-face clinical sessions using a numerical scale for students to rate their perceptions of anxiety and self-confidence with clinical decision making.

Conclusion: Fourteen items were identified as statistically significant for reported increased self-confidence with clinical decision making in traditional face-to-face clinicals compared to virtual clinical simulation. Two items were identified as statistically significant for increased anxiety with clinical decision making in virtual clinical simulation compared to traditional face-to-face clinicals.

Implications for Nursing: This study may enlighten the schools of nursing, accrediting bodies, and state boards of nursing with the usefulness of virtual clinical simulation in future nursing curriculum.

Keywords: virtual clinical simulation, nursing students, perceptions, anxiety, self-efficacy, self-confidence, knowledge, learning satisfaction

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Differences in Student Perceptions with Virtual Clinical Simulation

Introduction

As clinical placement of nursing students in hospital settings increases in difficulty, the use of virtual clinical simulation has become a favorable supplement to nursing education and is considered to be beneficial to the education of nursing students. Although virtual clinical simulation was initially a gradual, evolving learning method, many nursing schools were prompted to quickly shift to utilize more of this technology when Coronavirus Infectious Disease progressed to the United States (NCSBN, 2020a). With the sudden transition from face-to-face clinicals to virtual clinical simulations, questions arose regarding the effect this transition would have on the quality of learning provided and the impact it had on nursing students. Patient care is the top priority of nursing, and it is important to analyze the outcomes of learning satisfaction demonstrated by the levels of anxiety and self-confidence with clinical decision making of future nurses impacted by this change in clinical delivery (NCSBN, 2020b).

Background

Nursing schools across the country have utilized traditional clinical experiences in the hospital setting with face-to-face contact with patients and hospital staff since the early 1900s, when more formal nursing education was established (Rowe & Halstead, 2009). This was in part due to the increased need for healthcare assistance during wartime and was a project initiated by the Army School of Nursing in the United States (Rowe & Halstead, 2009). Simulation was employed in the early years of formal nursing education with the use of mannequins to assist caregivers in skills practice (Aebersold, 2018). Since that time, clinical simulation has taken many forms including low-fidelity

simulations, high-fidelity simulations, and virtual simulations. Currently, simulation continues to be an integral part of the nursing curriculum to deliver real-world experience to the novice student nurse (Aebersold, 2018).

The National Council for State Boards of Nursing Simulation Study showed promising results on nursing education outcomes when replacing traditional face-to-face clinical hours with simulation experiences (Jimenez, 2017). As technology evolved in the 2000s, nursing schools began to implement virtual clinical simulations in on-campus simulation labs and remote locations as a supplement to traditional clinical and lab training (Aebersold, 2018). The Accreditation Commission for Education in Nursing (ACEN) defines virtual simulation as "practice learning experiences that are computer-generated simulations with virtual (e.g., three-dimensional images) patients and/or care environments for the development of nursing knowledge and skills (ACEN, 2020, p. 18)". The National League for Nursing (NLN) has promoted various forms of simulation in nursing curriculum since the early 2000's (National League for Nursing, 2021). In 2014, the NLN gathered faculty feedback from a piloted virtual simulation program, and as a result, developed guidelines to assist schools of nursing in its implementation (National League for Nursing, 2021). Since that time, the NLN co-developed a virtual clinical simulation platform maintaining the position that it helps develop nursing students' clinical reasoning skills, competence, and confidence in patient care (National League for Nursing, 2021).

Although ACEN acknowledges virtual simulation as a useful tool, the accrediting body maintains the position that the utilization of virtual clinicals is not intended to be a complete substitute for hands-on learning experiences for undergraduate nursing students

(ACEN, 2020). With the outbreak of Coronavirus Infectious Disease in 2019, nursing school students were prevented from entering hospitals for a period of time for clinical training (NCSBN, 2020b). ACEN allowed nursing schools to continue with distance education and teaching activities through the remaining physical year without obtaining ACEN approval (ACEN, 2020). The accrediting body makes it clear, however, the requirement for nursing programs to have face-to-face clinicals throughout the length of the program is not waived, and each school should consult their presiding regulatory agency for further interpretation (ACEN, 2020).

The majority of nursing state licensure boards approved virtual clinical simulation to replace traditional face-to-face clinicals in an emergency plan development (NCSBN, 2020a). The Alabama Board of Nursing released a statement to all state nursing programs which permitted the use of virtual clinical simulation hours for course completion (NCSBN, 2020). With this approval, nursing schools quickly resorted to increase the use of virtual clinical simulation to fill the void of traditional clinicals, which allowed nursing students to continue to progress through their respective programs of study. In doing such, nursing students at the study site transitioned to spending their clinical instruction in its entirety to virtual clinical simulation by the summer of 2020, leading one to question the students' perspective of anxiety levels and self-confidence in clinical decision making gathered by this alternative route.

Problem Statement

Current world conditions have led to the necessity of implementing virtual clinical simulation in place of traditional face-to-face clinicals in nursing schools. This circumstance begs inquiry into the effectiveness of virtual clinical simulation compared

to traditional face-to-face clinicals, and whether it is indeed an adequate replacement for traditional clinicals in the future.

For this project, the PICOT question is as follows: How does fifth-semester associate degree nursing students' (P-Population) participation in a virtual clinical simulation program (I-Intervention) impact students' anxiety (O-Outcome) and self-confidence (O-Outcome) in clinical decision making over one semester (T-Time) compared to participation in traditional clinicals (C-Comparison)?

This Doctor of Nursing Practice (DNP) project aims to address the PICOT question directly by lending further insight into the use of virtual clinical simulation, and perhaps guide the future implementation of this additional learning modality.

Organizational Description of Project Site

Many nursing schools throughout the United States have transitioned to virtual clinical simulation as the Coronavirus Infectious Disease in 2019 and 2020 mandated the removal of students from hospital settings (NCBSN, 2020b). The site of study is an Associate's Degree Registered Nurse program in a community college in the southeastern region of the United States. The site is accredited by the Accreditation Commission for Education in Nursing (ACEN) and regulated and approved by the Alabama Board of Nursing (SUSCC, 2020). Approximately 65 nursing students graduate from the program twice a year. The fifth-semester students in this program transitioned from primarily traditional face-to-face clinicals to 100% virtual clinical simulation in the summer of 2020, and therefore, would have at least one full semester of experience and perspective with both types of clinical rotations.

Review of the Literature

Reasons for Implementation of Virtual Clinical Simulation

There are several rationales for the integration of virtual clinical simulation in a nursing curriculum. A review of the literature demonstrated multiple circumstances contributing to the need to find creative and innovative ways to provide nursing education. According to the faculty at Vanderbilt University School of Nursing, the creative structure of virtual nursing clinical experiences was necessitated by the 2019 Coronavirus pandemic (VUSN Communications, 2020). Instructors were challenged to modify clinical instruction outside of a hospital setting while ensuring the experience provided useful and realistic exemplars to help develop student competency (VUSN Communications, 2020).

Other limitations which led to the necessity for the use of virtual clinical simulation included the increased volume of student nurses and the decreased options for student placement (Cobbett & Snelgrove, 2016). As the need increased for numbers of healthcare staff to meet patient population demands, clinical placement for students was becoming more difficult, particularly in specialty areas (Verkuyl, Atack, Mastrilli, & Romaniuk, 2016). Developments in instructional technology helped to fill the void of face-to-face clinical experiences. Multiple reviewed studies showed improvements in both the competence and skills of nursing students using virtual clinical simulation (Cobbett & Snelgrove, 2016, Peddle, Mckenna, Bearman, & Nestel, 2019, Verkuyl & Hughes, 2019). In addition to the utilization of virtual clinical simulation as a replacement for traditional face-to-face clinical experiences, some schools have

incorporated virtual simulation into classroom instruction to enhance learning and retention. Compared to traditional lecture and low-fidelity simulation, virtual clinical simulation offered another layer of pedagogy, which proved to be beneficial to nursing students (Padilha et al., 2019).

Student preference and learning satisfaction. Student preference and learning satisfaction are areas of concern as virtual clinical simulation evolves. A study by Cobbett and Snelgrove (2016) did not show a significant difference in learning outcomes and knowledge with the implementation of virtual clinical simulation. Studies by Cant & Cooper (2017) and Padilha et al. (2019), however, revealed increased knowledge and benefits to learning for nursing students using virtual clinical simulation. Additional literature suggests increased knowledge and improved knowledge acquisition with the use of virtual clinical simulation (Borg Sapiano, Sammut, & Trapani, 2018, Woon, et al., 2021). The abundance of evidence demonstrated positive student perceptions of virtual clinical simulation, along with reported satisfaction with the experience. Students stated virtual clinical simulation was valuable and assisted them with the retention of information for exams (VUSN Communications, 2020; MacRae, Jara, Tyerman, & Luctkar-Flude, 2021). One reviewed study revealed students preferred to use virtual clinical simulation to makeup for absences of a traditional face-to-face clinical (Foronda et al., 2018).

Student anxiety levels. Although an important component to consider, there is limited information available regarding the differences in student anxiety levels with virtual clinical simulation compared to traditional face-to-face clinicals. Foronda et al. (2018) affirmed student frustration with virtual clinical simulation, which was primarily due to

difficulties in the navigation of the computer program. One suggested way to overcome this barrier was to improve orientation to the program being used (Foronda et al., 2018). Cobbett and Snelgrove (2016) reported increased anxiety in nursing students using virtual clinical simulation. Conversely, when considering general web-based education, Bektas and Yardimci (2018) reported decreased anxiety scores with clinical decision making in nursing students preparing for pediatric clinicals. Atthill, Witmer, Luctkar-Flude, and Tyerman (2021) also discovered reduced anxiety with clinical decision making with asynchronous virtual debriefing sessions with nursing students, especially in the area of data-gathering.

Student self-confidence. Another overwhelming theme present in the literature was to determine how virtual clinical simulation affects student self-confidence. Two separate studies reported no significant statistical differences in students' self-confidence with virtual clinical simulation compared to traditional face-to-face clinicals (Cobbett & Snelgrove, 2016, Padilha et al., 2019). Cant and Cooper (2017) provided evidence of improvement in students' self-efficacy with virtual clinical simulation; however, they declared the information gathered was subjective and could be biased. Another study by Verkuyl and Hughes (2019) reported increased self-efficacy among nursing students using virtual clinical simulation. In a separate study evaluating web-based learning for nursing students prior to pediatric clinicals, the students reported increased self-confidence in clinical decision-making (Bektas & Yardimci, 2018). A study by Redmond et al. (2020) revealed nursing students reported an increase in self-confidence with wound care after the experience with a virtual patient, as they were able to apply nursing theory in a safe environment. Similarly, both student scores and students' perceptions of

abilities indicated improved clinical judgment according to research by Fogg, Kubin, Wilson, and Trinka (2020).

Conclusion of Literature Review

Virtual clinical simulation can be a practical and effective method of instruction in nursing schools, either solely or in combination with traditional face-to-face clinical instruction. With limited bedside clinical availability and the evolution of technology, virtual clinical simulation can provide an additional instructional method to enhance traditional clinical learning (Woon et al., 2021). When surveying students after the transition from traditional clinicals to virtual clinical simulation, the majority of responses indicated a positive and valuable learning experience (Fogg, et al., 2020). MacRae, Jara, Tyerman, and Luctkar-Flude (2021) found most learners recommended continued use of virtual learning experiences.

Other studies indicated virtual clinical simulation is not only a useful learning tool, it is also capable of producing improved clinical competencies (Borg Sapiano, et al., 2018, Redmond et al., 2020). Specifically, Borg Sapiano et al. (2018) found the use of virtual clinical simulation assisted students in learning to manage complex patient scenarios. This is an important feat as novice nursing students are not often exposed to multiple complicated patient cases, even in traditional face-to-face clinical settings. Additionally, a study by Peddle, Bearman, Mckenna, and Nestel, (2019) showed interaction with virtual patients increased the knowledge and experience of the learner in non-technical skills which could carry over into the clinical setting. This enhanced form of learning could lead to improved safety and competency in subsequent nursing decisions and actions (Peddle et al., 2019).

With the use of virtual clinical simulation gaining popularity in nursing schools across the country, it would be beneficial to evaluate its impact on nursing students' anxiety and self-confidence with clinical decision making, as this could affect the delivery of patient care. Overall, the current literature showed increased self-confidence with the clinical decision-making of nursing students. No studies reviewed indicated a decrease in self-confidence with the utilization of virtual clinical simulation. Although Corbett and Snelgrove (2016) report heightened anxiety associated with the use of virtual clinical simulation, which is often the case with the implementation of a new tool, there was other evidence in existing literature showing decreased anxiety in nursing students using virtual clinical simulation (Bektas & Yardimci, 2018, Atthill et al., 2021). Based on these findings, further inquiry into the elements of student perceptions of anxiety and self-confidence with clinical decision making using virtual clinical simulation is warranted.

Evidence-Based Practice: Verification of Chosen Option

Based on the review of the literature surrounding the implementation of virtual clinical simulation, further evaluation was performed to analyze student preference. This added to growing evidence of the assumption of virtual clinical simulation as a beneficial element utilized in nursing school programs for clinical decision making. An evaluation tool developed by Dr. Krista White (2014) was administered to all qualifying nursing students in their fifth semester of school, comparing their experience with clinical decision-making in traditional face-to-face clinicals and virtual clinical simulation.

Theoretical Framework

The theoretical framework for this project was based on the NLN Jeffries Simulation Theory, which focuses on the experience around any form of simulation to best mold implementation for positive learning outcomes (Jeffries, Rodgers, & Adams, 2015). It includes context, background, simulation design characteristics, and interactions between the facilitator and the learner as noted in Appendix A (Jeffries, Rodgers, & Adams, 2015). The theory determines outcomes occur in three areas: the system, the patient, and the participant (Jeffries, Rodgers, & Adams, 2015).

First, contextual factors are discussed as having an important impact on the simulation (Jeffries, Rodgers, & Adams, 2015). Included in the context is the setting where simulation takes place and whether or not the simulation is meant for teaching or evaluation of the participant (Jeffries, Rodgers, & Adamson, 2015). Both setting and purpose are valuable contextual factors to note as educators determine best practices for virtual clinical simulation for nursing students. Inquiries regarding whether the setting has a significant impact on student anxiety and confidence will help determine a preferred location such as an on-campus site, including a classroom or lab, or a remote location. The outcome goal of teaching or evaluating the participant may also play a role in how virtual clinical simulation is delivered.

The theoretical framework of Jeffries (2015) explains the importance of background when deciding how to implement simulation for students. The purpose of the simulation and how it integrates into the nursing curriculum are useful to realize when implementation occurs (Jeffries, Rodgers, & Adamson, 2015). Additionally, utilization of resources purposed for simulation is a consideration for nursing schools, as they decide

how to allocate time, equipment, and instructors (Jeffries, Rodgers, & Adamson, 2015). How students receive virtual clinical simulation could affect their perceptions of anxiety and self-confidence in clinical decision-making.

Characteristics of simulation design should be reviewed prior to implementation (Jeffries, Rodgers, & Adamson, 2015). According to Jeffries (2015), elements of design such as scenarios, content, and learning objectives would be determined. Other methods to establish the simulation design would include physical and conceptual fidelity consisting of both the physical items used such as equipment, as well as the conceptual factors such as facilitator and participant responses (Jeffries, Rodgers, & Adamson, 2015). In order to provide an authentic simulation experience, both the facilitator and the participant are responsible for maintaining an environment which is learner-centered, experiential, interactive, and collaborative (Jeffries, Rodgers, Adamson, 2015). The dynamic interaction between the facilitator and the participant strongly affects the simulation experience, with the facilitator needing to be equipped to respond to participant actions and the participant's level of anxiety and self-confidence impacting their learning (Jeffries, Rodgers, and Adamson, 2015). As computer software is selected by nursing programs, acknowledgment of these elements of design could allow for better instruction for the students.

The outcome of Jeffries' theory features the participant's behavior, learning, and satisfaction with the simulation leading to improvements of both the system and the educational role of the facilitator (2015). As the theory explains, understanding the outcome of simulation generates further research interest in how this affects medical patients (Jeffries, Rodgers, Adamson, 2015). Nursing care is patient-centered and as

more institutions incorporate virtual clinical simulation into the curriculum, it would be of interest to learn if this affects patient outcomes (Jeffries, Rodgers, & Adamson, 2015).

Goals, Objectives, and Expected Outcomes

The goal of this project was to help answer the PICOT question regarding the implementation of virtual clinical simulation for nursing students and its effects on students' perceptions of anxiety and self-confidence with clinical decision making compared to traditional face-to-face clinicals. Increased knowledge of the students' perceptions of this information would perhaps lead to guided decision-making regarding the future of nursing curriculum. Objectives included measuring the students' perceptions by using a validated tool to address each item in the PICOT question on a Likert scale. This was performed by the writer with an electronic survey submitted to each qualifying fifth-semester student in the Spring semester of 2021.

Expected outcomes included noting statistically significant differences in students' reported anxiety level and self-confidence with clinical decision making in virtual clinical simulation compared to traditional face-to-face clinicals. Expected differences would include reported increased anxiety and increased self-confidence with clinical decision making in the virtual clinical simulation setting, as the most recent evidence demonstrates. Additional expected outcomes include willing participation in the student survey, along with reliable responses.

Project Design

This project design was a pilot study containing both retrospective and descriptive information using primary data to determine if the implementation of virtual clinical simulation impacts students' perception of their level of anxiety and self-confidence with

clinical decision making compared to traditional clinical experiences in nursing school. Unlike raw data, descriptive statistics provided meaning to the data set. Including descriptive details about the participants studied, such as age, gender, and types of clinical participation, provides more conclusive information on the research. It is difficult to elicit accurate comparisons without the use of descriptive data (Tochim, 2020).

In an effort to compile data to answer the PICOT question, a specific method of data collection took place. A validated tool by Dr. Krista A. White, researcher, author, and professor at Georgetown University, was used to assess the nursing students' perceptions of anxiety and self-confidence with clinical decision-making using virtual clinical simulation and traditional face-to-face clinicals (White, K., 2014). This tool was administered electronically to a cohort of nursing students in their final semester of nursing school.

In addition to the use of a validated tool, students were asked to journal their thoughts and opinions regarding virtual clinical simulation and traditional clinical experiences. Analysis of student perception allowed insight into the learners' advancement through the nursing program and contributed to the evaluation of student and program success to evoke improvements. The research study method quantified participant responses in an attempt to explore the correlation between student perceptions and the type of clinical setting utilized.

Project Site and Population

The project site was located at a community college in rural East Central Alabama housing an accredited ADN program. As of Fall 2019, this college had a general

population of 4,655 students with 44.6% male and 55.4% female students (National Center for Education Statistics, 2020). The racial makeup of the general student population is 71.2% Caucasian, 21.2% African American, 1.9% two or more races, and 1.8% Asian (NCES, 2020). Reported student ages showed 64% of students were between the ages of 18-21, 25% were aged 22-29, 6% were aged 30-37, and 5% were under 18 years of age (NCES, 2020). The ADN program had a semester enrollment of between 250-300 students, with approximately 65 students in each of the five cohorts.

The population for the study was fifth-semester ADN students from Spring semester 2021. Non-probability convenience sampling was used for population selection, as this group of students was available to the researcher. Inclusion criteria was full-time students enrolled in the fifth semester ADN program, as this group has experienced both traditional clinical experiences and virtual clinical simulation. These eligible participants were in their final semester of nursing school and were selected due to their completion of at least one full semester in both traditional clinical and virtual clinical simulation. Criteria for exclusion was any student who did not complete at least one full semester in both traditional clinical and virtual clinical simulation. Given the age demographic makeup of the population group, the use of technology was not considered to have bearing on the interpretation of the results. Interaction among the researcher, students, and college representatives was on a professional level and mostly electronically to implement the study. The Nursing Department Chair, Dean of Health Sciences, and the President of the College granted permissions via letters of support for the collection of data and analysis for this project (Appendix B).

Setting facilitators and barriers. The college conducts a portion of its courses electronically with the use of email and a learning management platform. Students are equipped with a computer and internet service as a requirement to attend the ADN program. Accessibility to the college representatives and students helped facilitate data collection. Barriers to the implementation of the study included a lack of participant motivation. This barrier was overcome by ensuring participation in the study is simple and not time-consuming.

Implementation, Plan/Procedures

Planning

The initial phase of project development was accomplished with permissions from the college administrators, which aided in the access to participants. Prior to implementation, meetings were held with the project team including the researcher's chairperson from the DNP program, the preceptor selected by the researcher, the researcher's co-instructor at the community college, the tool developer, and the statistician. The goals of the project were effectively communicated including the project's purpose of identifying potential differences in student perceptions of virtual clinical simulation compared to traditional face-to-face clinicals. Team members were briefed regarding the impact of the study findings potentially leading to contributions to curriculum development. The researcher also ensured the team members understood the objectives of the project, the time and effort required, and the use of resources required, such as technology. The plan for data collection was communicated, and it was agreed upon to utilize forms to present a validated tool in an electronic format to be completed by student participants. Statistical evaluation and analysis of the results were performed

by Dr. Falynn Turley, Ph.D., an Assistant Professor of Business Statistics at Jacksonville State University.

Development and Description of Virtual Clinical Simulation Platform

In accordance with the Alabama Board of Nursing Continuity of Operations Plan (COOP), the Accreditation Commission for Education in Nursing (ACEN), and the Alabama Community College System (ACCS), a virtual clinical simulation experience was chosen to fulfill the required hours of clinical experience for nursing students. An electronic platform to administer the instructor-guided virtual clinical simulation was selected. The platform allowed access to patient avatars to enable nursing students to review electronic health records, develop history-taking skills, perform physical assessments, prioritize appropriate nursing interventions and actions to perform based on the patient's scenario, and develop nursing documentation. The platform was chosen based on its stated objective of its use to "help students gain confidence in their clinical judgment skills for success on the NCLEX and beyond (i-Human, 2020, Homepage)." This was accomplished based on the use of the platform's 45 patient cases divided into five specialty categories including obstetrics, mental health, medical/surgical, pediatrics, and community health (i-Human, 2020). This allowed the students to interact with life-like patients who respond to questions, breathe, blink, and react to interventions (i-Human, 2020).

Conduction of Virtual Clinical Simulation

During the 8-week instructor-led virtual clinical simulation, students worked 10 hours per week using patient scenarios to determine key findings in the specific areas of electronic health records, history, and physical assessment. The students' findings were

then compared to the case expert's findings from the electronic platform. This allowed the nursing student and instructor to analyze any incorrect findings or deficits of the nursing students' knowledge while reviewing rationales for the information. Further tasks were performed depending on the particular virtual patient case and included analyzing the patient's condition and prioritizing nursing interventions. Documentation was performed, followed by a review of the patient's summary to conclude the case (Appendix C, Table 1).

Evaluation of Virtual Clinical Simulation

In an effort to evaluate performance and measure outcomes for nursing students in the clinical setting, the college used a Daily Self-Performance (DSP) tool (Appendix D). This tool was completed by the nursing student after each clinical experience and demonstrated examples of proficiency in the categories of Human Flourishing/Patient Centered-Care, Nursing Judgment/Safety/Informatics, Professional Identity/Teamwork/Collaboration, and Spirit of Inquiry. The nursing student completed each section with an entry exemplifying a specific outcome for each category accomplished during the clinical experience. DSPs have been used for the past seven years at the college for traditional face-to-face clinicals and were also used after each virtual clinical simulation. A review of DSPs from both types of clinical settings was performed and is of interest to the DNP project.

Monitoring the Project

The project was monitored throughout the implementation phase by the primary researcher to assess for any issues with the timeline or completion of the forms by participants. Project monitoring of the study ensured all team members were meeting

timeline expectations and addressing potential barriers to the study. Lack of participation among the subjects was an initial barrier discovered and was rectified by motivating participants to complete the tool. Also, an extended period of time for tool access and completion was allowed.

Evaluation of the Project

Once the implementation of the research was completed, the primary investigator collected all results to be evaluated and submitted this data to the project statistician for analysis.

Measurement Instruments

To measure the outcomes of this DNP Project, the following instrument was used: Nursing Anxiety and Self-Confidence with Clinical Decision Making Scale (NASC-CDM) © by Krista A. White, Ph.D., R.N., CCRN-K, CNE**.** This validated tool (Appendix E) contains 27 items to evaluate the participants' perceptions of anxiety and self-confidence during clinical decision making using a six-point Likert-type scale.

Participants in the study were counted only once on the instrument. Adequate sample sizes were used to increase reliability. Data measurement took place post-intervention with the analysis of submissions via electronic forms.

Data Collection Procedures

Once planning and permissions were complete, implementation of the project took place according to the proposed timeline. Information to recruit participants was sent to qualifying students using a learning management platform. Data was collected via electronic surveys. Data was entered into a spreadsheet for further analysis. The statistical evaluation was then performed (Appendix F).

Project Recruitment

An announcement was sent electronically March 1, 2021 to all potential candidates for voluntary participation in the study. An informed consent (Appendix G) was completed with physical signatures by all recruited nursing students who chose to participate in the study.

Actualizing the Intervention

On March 8, 2021, the chosen instrument was sent electronically to the participants for completion of the tool and survey.

Data Collection

On April 12, 2021, all responses to the tool were collected from the participants. Also, demographic data was collected from the cohorts of ADN student participants using electronic forms.

Evaluation

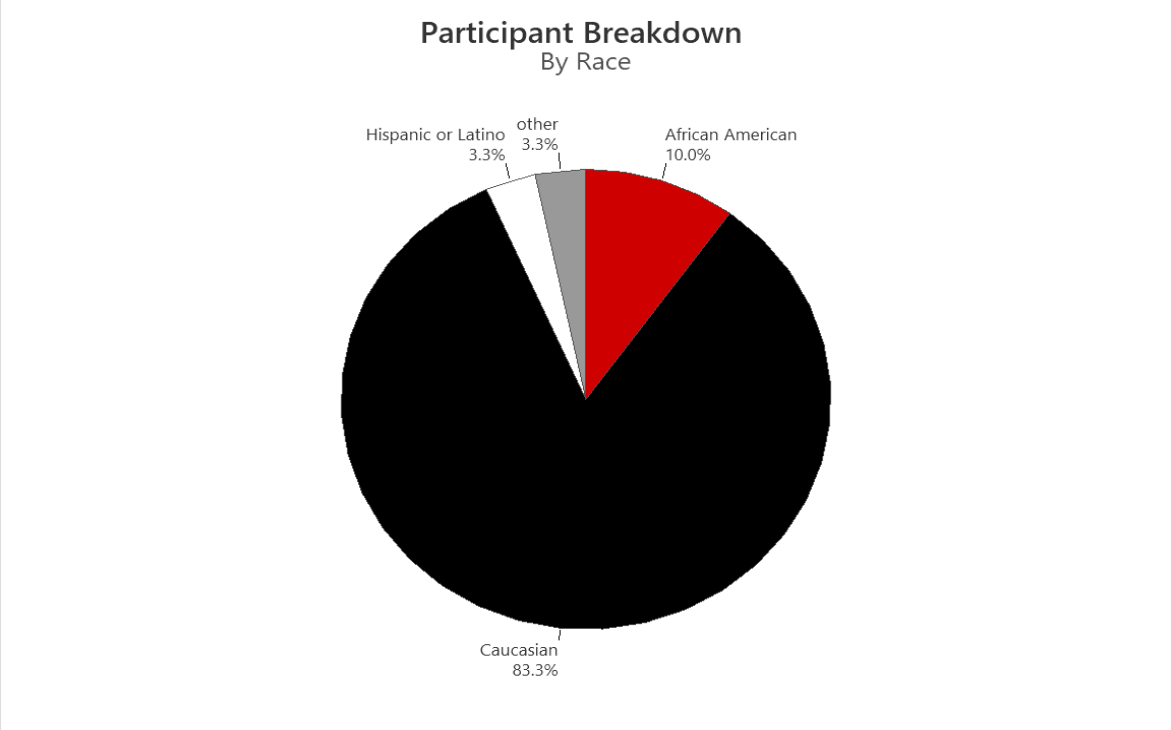
On May 10, 2021, collected data was reviewed and analyzed for statistical significance.

Data Analysis

A total of 30 nursing student participants were surveyed to assess his or her level of anxiety and self-confidence with clinical decision making in patient care. Participants conducted both traditional clinical visits and virtual clinical visits. Afterwards, participants completed the NASC-CDM© tool for each clinical type.

Figure 1

Participant Breakdown by Race



Note. When examining the demographics of the participants, half of the students were ages 18-25 (50.0%), eleven were ages 25-35 (36.7%), and four participants were older than 35 (13.3%). By race, most participants were Caucasian (83.3%), three were African American (10%), one was Hispanic/Latino (3.33%), and one selected "other" as his or her race (3.33%).

Additional demographic factors were collected concerning each participants' experience in the nursing field, educational assessments, and use of technology. When asked if he or she had ever repeated a semester of nursing school, 17 said no (56.7%) and 13 said yes (43.3%). Over half (56.671%) had experience in the medical field, and almost all (90.0%) scored a 900 or above on a comprehensive HESI. Interestingly,

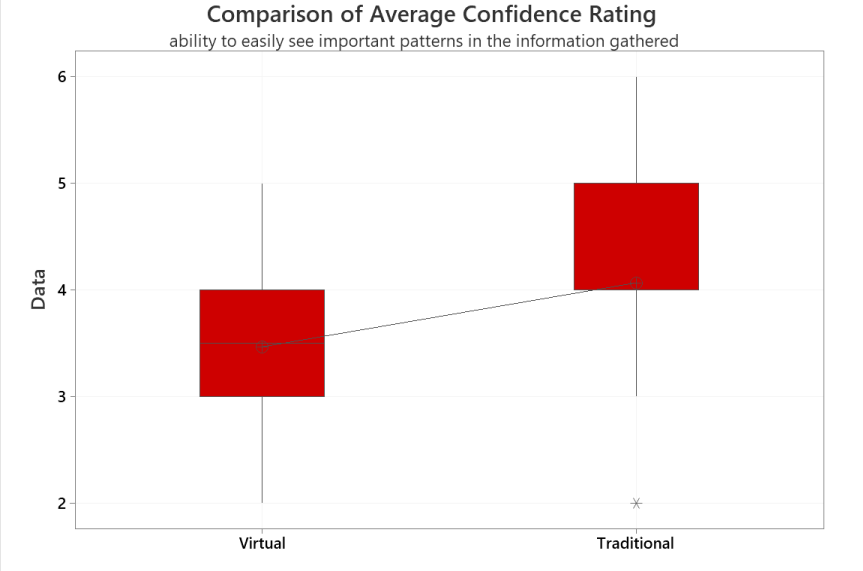
almost half of the respondents (53.3%) indicated that nursing was not his or her first career path.

A chi-square test of association was performed to detect if any relationships exist among the variables previously listed. At the 0.10 level of significance, score on comprehensive HESI was significantly associated with whether nursing was first career ($\chi^2 = 2.92$, df = 1, p = 0.088). All other categorical variable comparisons resulted in non-significant associations.

Participants were asked to respond to 27 statements after clinical sessions. The average ratings were compared between traditional clinical sessions and virtual clinical sessions using a series of paired t-tests assuming unequal variances with $\alpha = 0.10$. All 27 statements are presented with the average rating for each clinical type (Appendix H).

Figure 2

The NASC-CDM© Scale, Question 1

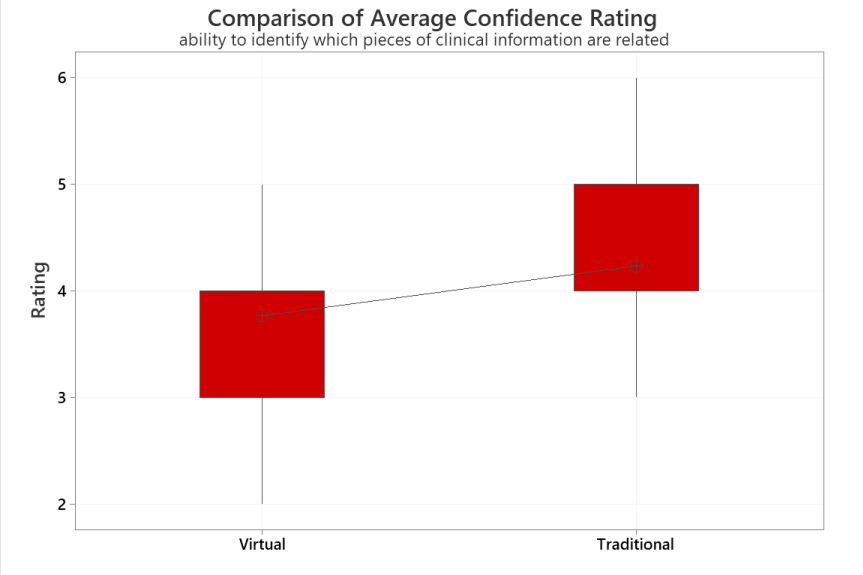


Note. The results of the analysis showed the average self-confidence rating for one's ability to easily see important patterns in the information he or she gathered from

the client was significantly higher when assessed through the traditional method (t = -4.27, df = 29, p < 0.001).

Figure 3

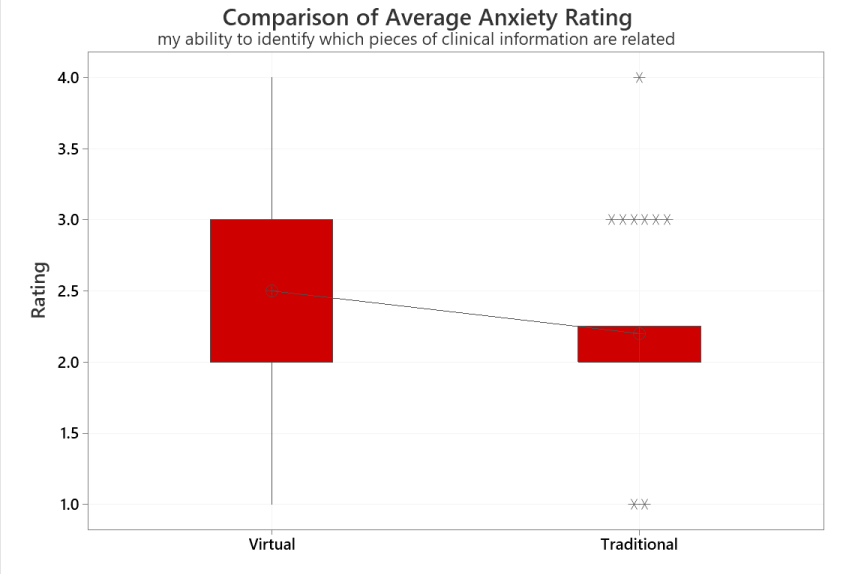
The NASC-CDM© Scale, Question 2



Note. The average self-confidence rating for one's ability to identify which pieces of clinical information he or she gathered are related to the client's current problem was significantly higher when assessed through the traditional method (t = -4.06, df = 29, p = <0.001).

Figure 4

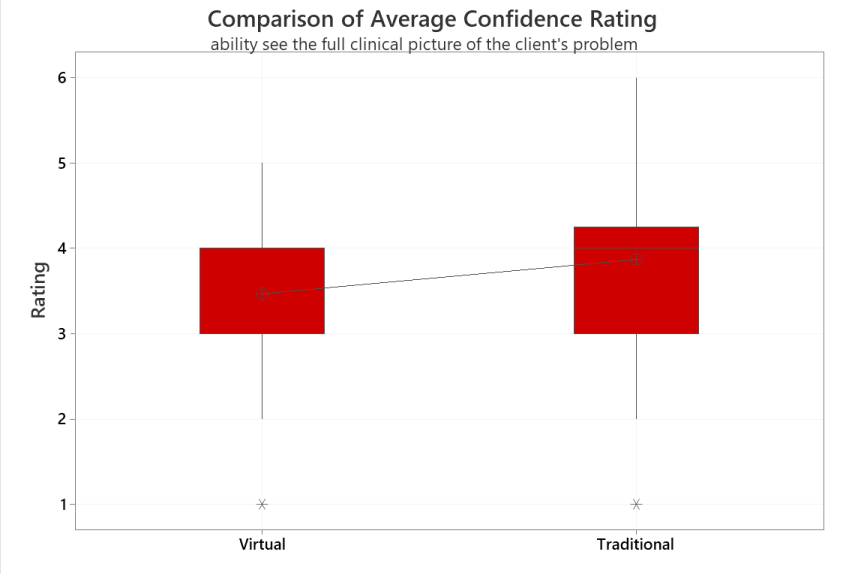
The NASC-CDM© Scale, Question 2



Note. The average anxiety rating for one's ability to identify which pieces of clinical information he or she gathered are related to the client's current problem was significantly higher when assessed through the Virtual method ($t = 2.07$, $df = 29$, $p = 0.048$).

Figure 5

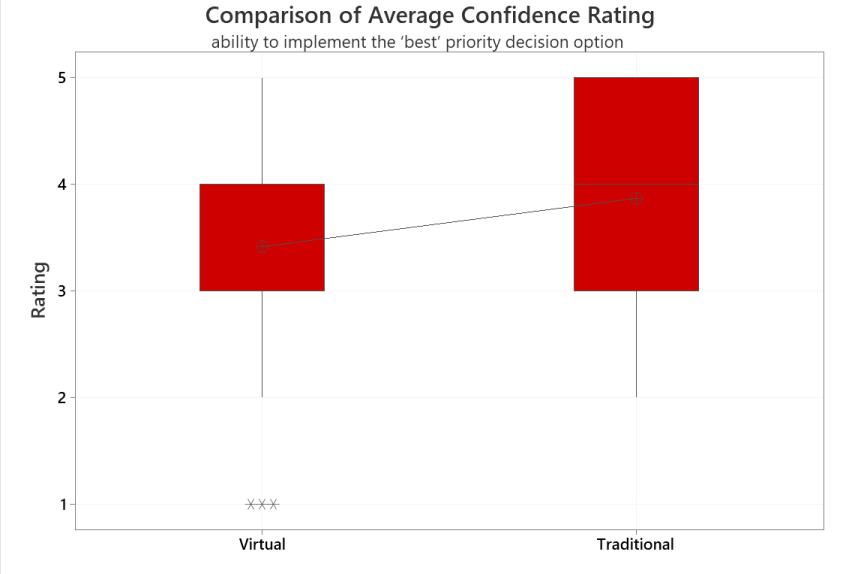
The NASC-CDM© Scale, Question 3



Note. The results of the analysis show that the average self-confidence rating for one's ability see the full clinical picture of the client's problem rather than focusing in on one part of it was significantly higher when assessed through the traditional method ($t = -2.69$, $df = 29$, $p = 0.012$).

Figure 6

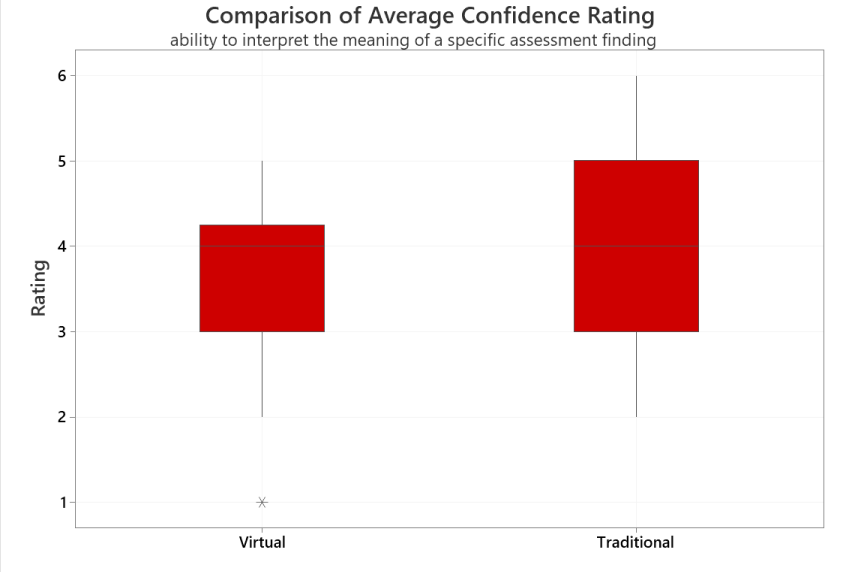
The NASC-CDM© Scale, Question 5



Note. The average self-confidence rating for one's ability to implement the 'best' priority decision option for the client's problem was significantly higher when assessed through the traditional method (t = -2.46, df = 28, p = 0.020).

Figure 7

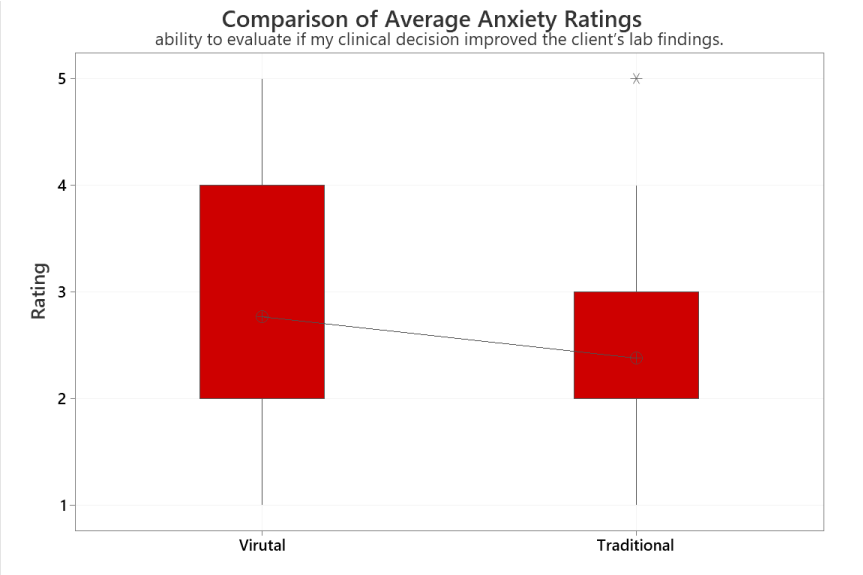
The NASC-CDM© Scale, Question 6



Note. The average self-confidence rating for one's ability to interpret the meaning of a specific assessment finding related to the client's problem was significantly higher when assessed through the traditional method (t = -2.11, df = 29, p = 0.043).

Figure 8

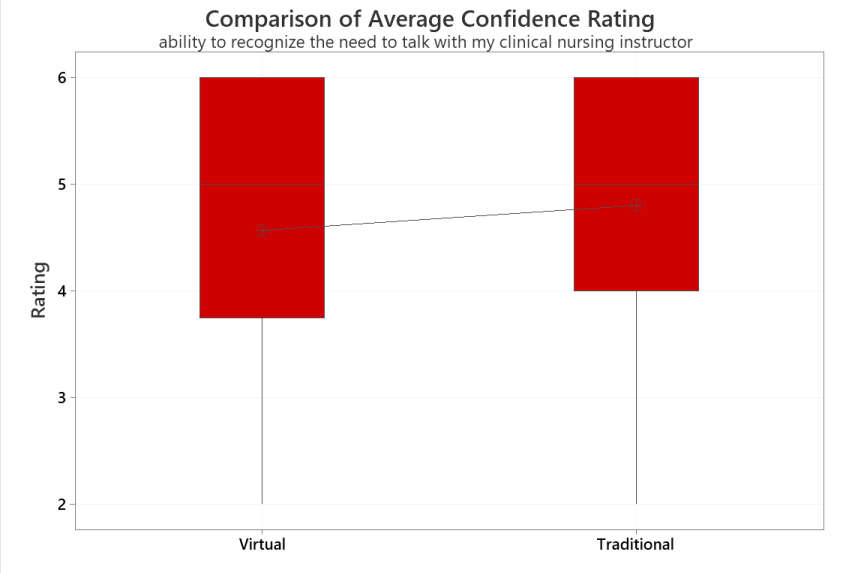
The NASC-CDM© Scale, Question 7



Note. The average anxiety rating for one's ability to evaluate if a clinical decision improved the client's laboratory findings was significantly higher when assessed through the Virtual method (t = 1.72, df = 28, p = 0.097).

Figure 9

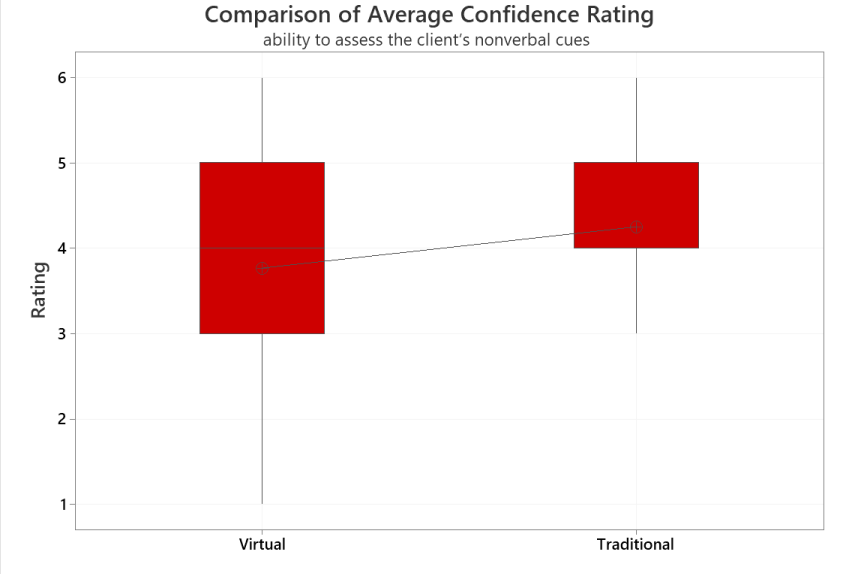
The NASC-CDM© Scale, Question 8



Note. The average self-confidence rating for one's ability to recognize the need to talk with clinical nursing instructor to help sort-out client assessment findings was significantly higher when assessed through the traditional method ($t = -1.76$, $df = 29$, $p = 0.090$).

Figure 10

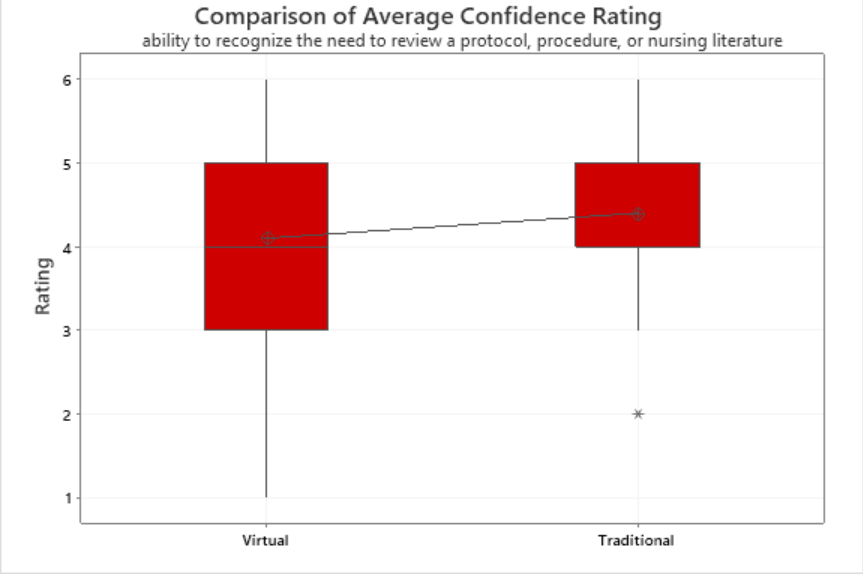
The NASC-CDM© Scale, Question 10



Note. The average self-confidence rating for one's ability to assess the client's nonverbal cues was significantly higher when assessed through the traditional method (t = -1.89, df = 27, p = 0.069).

Figure 11

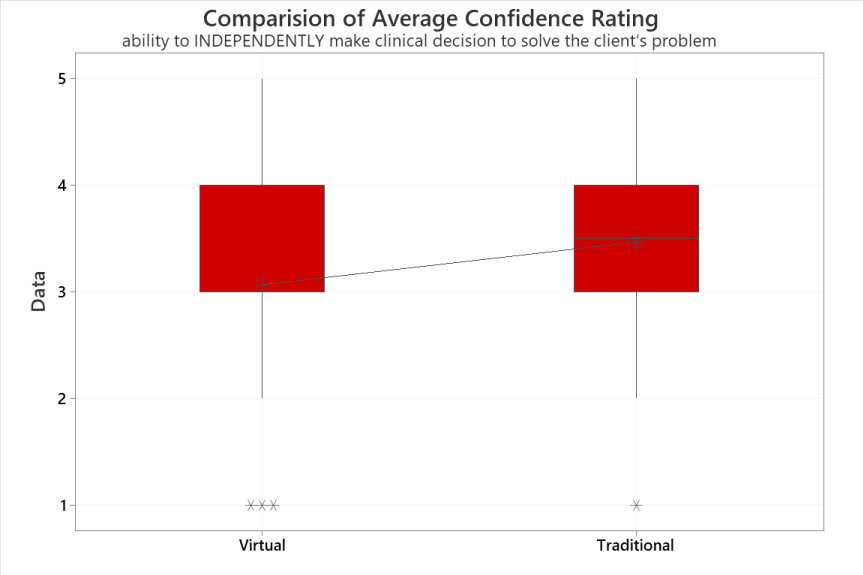
The NASC-CDM© Scale, Question 11



Note. The average self-confidence rating for one's ability to recognize the need to review a protocol, procedure, or nursing literature to help me make a clinical decision was significantly higher when assessed through the traditional method (t = -1.89, df = 27, p = 0.069).

Figure 12

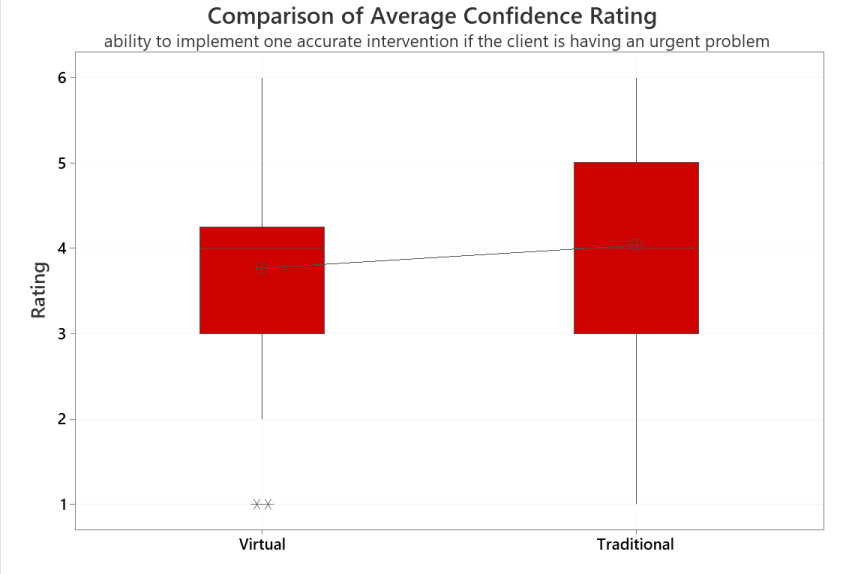
The NASC-CDM© Scale, Question 17



Note. The average self-confidence rating for one's ability to INDEPENDENTLY make clinical decision to solve the client's problem was significantly higher when assessed through the traditional method (t = -3.25, df = 29, p = 0.003).

Figure 13

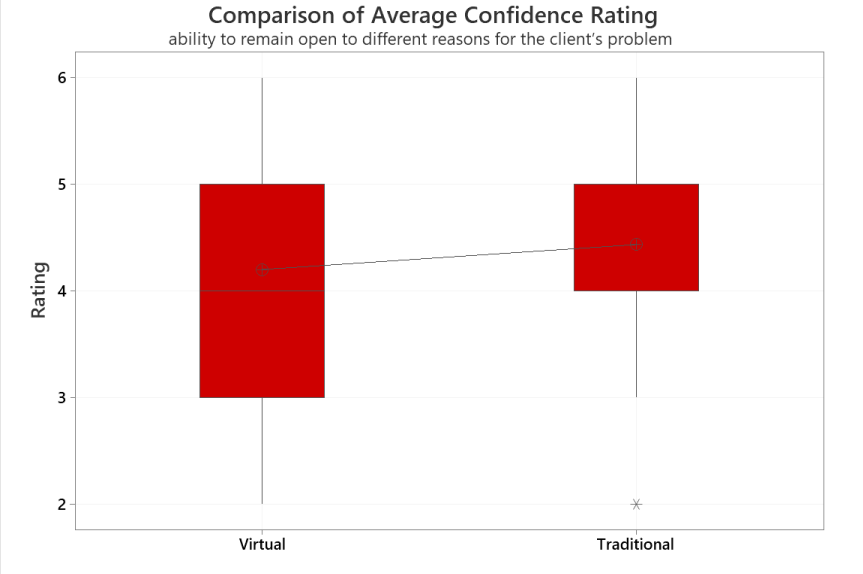
The NASC-CDM© Scale, Question 20



Note. The average self-confidence rating for one's ability to implement one accurate intervention if the client is having an urgent problem was significantly higher when assessed through the traditional method ($t = -2.11$, $df = 29$, $p = 0.043$).

Figure 14

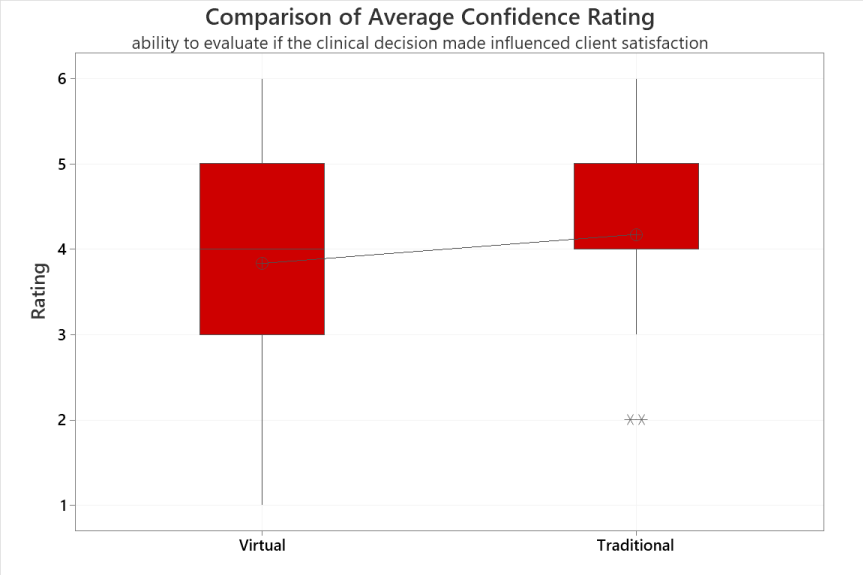
The NASC-CDM© Scale, Question 23



Note. The average self-confidence rating for one's ability to remain open to different reasons for the client's problem even though the information I gathered may point to only one reason was significantly higher when assessed through the traditional method (t = -1.88, df = 29, p = 0.070).

Figure 15

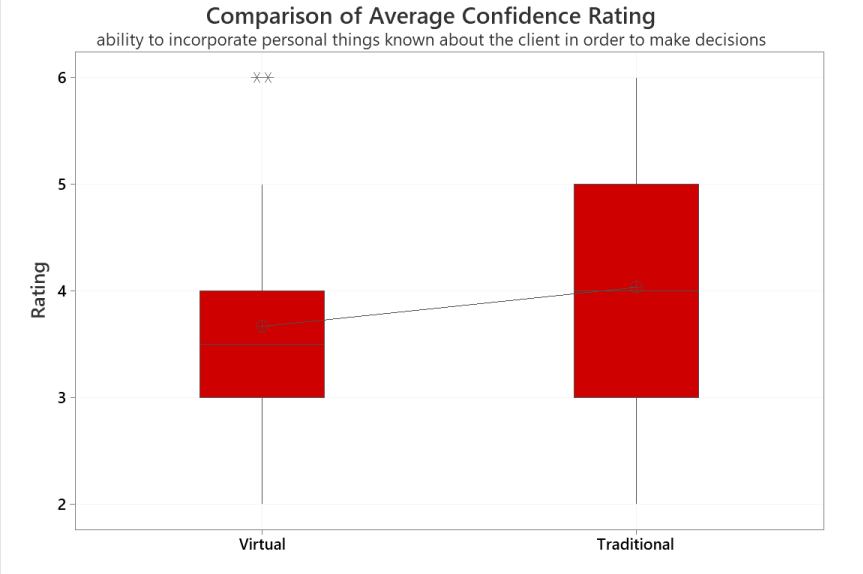
The NASC-CDM© Scale, Question 25



Note. The average self-confidence rating for one's ability to evaluate if the clinical decision made influenced client satisfaction was significantly higher when assessed through the traditional method (t = -2.42, df = 29, p = 0.023).

Figure 16

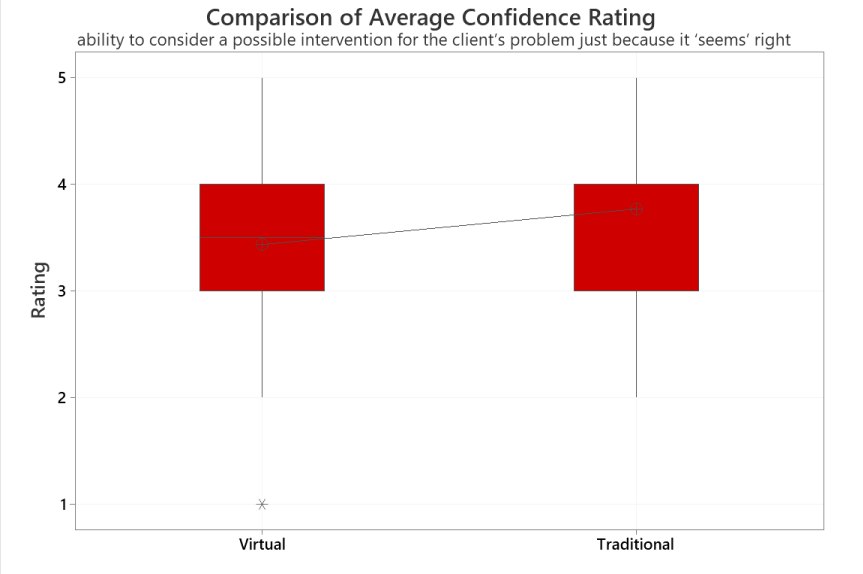
The NASC-CDM© Scale, Question 26



Note. The average self-confidence rating for one's ability to incorporate personal things known about the client in order to make decisions in his or her best interest was significantly higher when assessed through the traditional method ($t = -2.26$, $df = 29$, $p = 0.032$).

Figure 17

The NASC-CDM© Scale, Question 27



Note. The average self-confidence rating for one's ability to consider a possible intervention for the client's problem just because it 'seems' right was significantly higher when assessed through the traditional method ($t = -1.98$, $df = 29$, $p = 0.057$).

Results, Interpretation, and Discussion

Of the items assessed from the NASC-CDM© tool, 14 were statistically significant for participants reporting an increase in self-confidence with clinical decision making in traditional face-to-face clinicals. Increased self-confidence was reported in categories involving direct patient care, such as gathering information from clients, decision making, prioritizing care, interpreting assessment findings, recognition of non-verbal cues, incorporating client personal information, and evaluating client satisfaction.

Two items were noted to show increased anxiety with clinical decision making in virtual clinical simulation. While nursing students reported increased self-confidence in traditional face-to-face clinicals with gathering client information, this action seemed to

cause increased anxiety in virtual clinical simulation. Additionally, the participants reported increased anxiety when determining their ability to evaluate if clinical decisions improved a client's laboratory findings.

Interestingly, there are twelve items included in the NASC-CDM© tool showing no statistically significant differences in anxiety or self-confidence with clinical decision making in virtual clinical simulation compared to traditional face-to-face clinicals. The majority of these items correlate with the care of patients not requiring hands-on or face-to-face contact. Some of these items include knowledge recall, knowledge of diagnostic tests, recognizing important information, and knowledge of anatomy and physiology. Also, included are items such as acting on interventions based on intuition, analyzing risks of interventions, and using listening skills.

The preponderance of the evidence suggests a nursing student's perceptions of traditional clinical learning was more positively affected when the type of nursing action or intervention required physical interaction. Hands-on tasks are seemingly more difficult to accomplish in a virtual setting, which appeared to be a determining factor in showing an increase in the students' self-confidence when performing these types of tasks in a traditional setting. Conversely, the evidence suggests the same hands-on actions were not favorable for nursing students to perform in a virtual setting.

The two findings of increased anxiety with clinical decision making in a virtual clinical simulation correlate to the software program used. Both gathering appropriate client data and evaluating if decisions improved laboratory findings of a client were sections of the virtual cases utilized requiring accurate answers before a student could progress to the next section of the case. This leads one to consider if anxiety is

heightened in these instances based on the pressure of needing to answer questions correctly while participating in virtual clinical simulation with instructors and classmates present.

In addition to the NASC-CDM© tool analysis, student journaling provided further insight into student perceptions of clinical type. When briefly describing the advantages of traditional face-to-face clinical, students used phrases such as learned time management, got hands-on experience, and able to practice nursing skills. These thoughts correspond to the earlier findings. Disadvantages of traditional clinicals include statements such as not enough time to discuss new things, not as much one-on-one instruction due to fast pace, sometimes there is a lack of support from staff, and fear of mistakes.

The students also journaled their thoughts regarding advantages of virtual clinical simulation. Some of these include spend more one-on-one time with instructors, more in-depth learning about disease processes, pathophysiology and medications, you see a variety of patients, able to ask more questions, and no consequences for mistakes. Disadvantages of virtual clinical simulation were reported as no real-life experience, hard to stay focused on the computer, no hands-on tasks, and no patient interaction.

While statistical findings showed many instances of increased self-confidence in clinical decision making with traditional clinical, when coupled with student responses, a benefit is seen from the use of virtual clinical simulation as well. There is no indication virtual delivery of clinical education should be considered a replacement for traditional face-to-face clinical experiences. There is value to be found in both delivery methods, with virtual clinical simulation perhaps found to be more beneficial when used earlier in a

nursing program, and traditional face-to-face clinicals more beneficial when used in later semesters.

Cost-Benefit Analysis/Budget

This project utilized an electronic tool and survey and had no financial costs. There was a considerable amount of time given by the Researcher, the Project Chair, the Preceptor, and others on the committee. The institution where the project took place may benefit from the results of the project as it adds to the understanding of student perception and learning when using virtual clinical simulation. This information aids in program planning and curriculum development for future nursing students. Also, instructors gained a better understanding of how successful the students feel when participating in virtual clinicals.

With this study information, the instructors were able improve aspects of virtual clinical simulation, such as implementation. Nursing students also benefited from participating in the study by providing valuable information to the researcher potentially helping to establish goals for future virtual clinical simulation. This would eventually impact the quality of nurses in the work force. Resources used for the project are already in place such as computers, internet access, and applications, leaving no financial burden for the institution.

Timeline

The approval date for the study from the institution was August 18, 2020. Institutional Review Board approval from the DNP program was gained October 30, 2020 (Appendix G). An electronic student announcement was sent to all eligible participants on March 1, 2021. Instruments for student participant completion were sent

electronically on March 18, 2021. Data collection and initial evaluation was completed April 12, 2021. Statistical interpretation was completed May 10, 2021. These actions aligned with the proposed timeline (Appendix I).

Ethical Considerations/Protection of Human Subjects

The Jacksonville State University Institutional Review Board (IRB) approval was obtained before initiating the DNP project. Ethical considerations and the protection of participants was maintained throughout the study. Risks to the participants were minimal and included the use of time and effort in completing the electronic surveys. There was no physical risk to the participants. All participants were protected by the Health Insurance Portability and Accountability Act of 1996 (HIPAA), which guarantees the privacy of patients' health information (Modifications to the HIPAA Privacy, Security, Enforcement, and Breach Notification Rules, 2013). All individual student participants remained anonymous by using participant identifiers. The confidentiality of participants was maintained by the use of password-protected electronic files with accessibility to the researcher only.

Conclusion

Virtual clinical simulation is sustainable and familiarizes nursing students with clinical actions without the fear of mistakes. It is a favorable addition to nursing education, especially in the earlier semesters when students are learning how to care for patients for the first time. Not only is virtual clinical simulation sustainable with evolving technology, it has already been incorporated into many nursing curriculums due to the pandemic.

Determining if virtual clinical simulation is an adequate addition to or replacement of traditional face-to-face clinicals for nursing students is important to ensure quality standards of clinical experience and education are met. Student feedback and perceptions are one way to evaluate the effectiveness of this additional teaching method. This study's data suggested a student's perception of self-confidence with clinical decision making was increased in the traditional face-to-face setting, especially when performing nursing actions involving direct interaction with patients. Also suggested, is the student's level of anxiety was increased when performing these similar actions virtually. Further research is recommended to evaluate if students' reported anxiety was increased in the virtual setting due to the need to have all the correct answers to move forward with the virtual program.

Despite the positive educational outcomes of the use of virtual clinical simulation, the available data revealed it would be inadequate to use as a complete replacement for traditional clinicals, especially when nursing students are practicing hands-on skills and needing to experience live patient interaction. Incorporating virtual clinical simulation into nursing curriculum would be a helpful supplement to nursing education, as long as consideration is given to the timing and implementation in the program. For students nearing the end of a nursing program, a traditional clinical setting would allow them to practice real-life scenarios, nursing skills, responding to patient behaviors, and time-management, all of which would be difficult to recreate in a virtual program.

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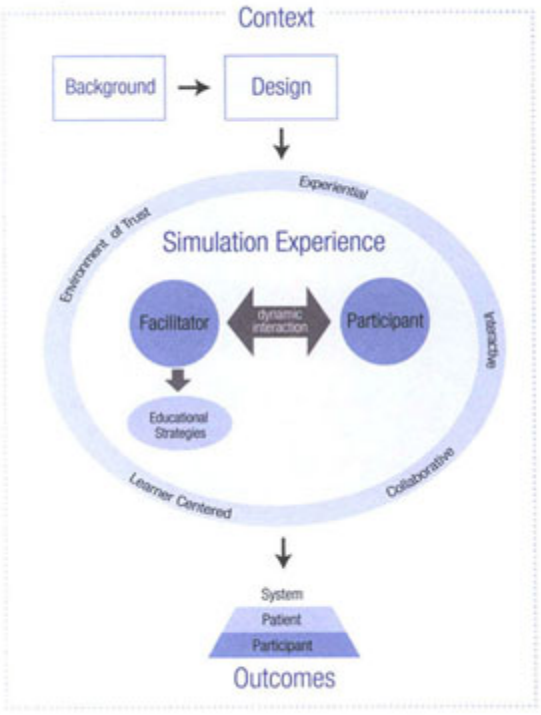
Appendices

Appendix A

Diagram of NLN Jeffries Simulation Theory

Figure: NLN Jeffries Simulation Theory



Appendix B

Table 1

Patient	Description	EHR findings	History findings	Physical findings	Actions and Interventions	Case Summary
Module 1	22 YO male Abdominal Pain	Acute onset mid-abdominal pain Onset 8 hours	Anorexia Nausea Pain 6/10	RLQ tenderness Slight guarding Mild rebound tenderness Hypoactive bowel sounds Poor skin turgor	None	CT revealed Appendicitis Laparoscopic surgical removal Discharged the next day
Module 2	48 YO female Neurological deficit	Headache Dysarthria Disorientation Hypertension Left-sided weakness Abnormal NIH stroke scale Left-sided facial droop	Headache Dysphagia Medication Noncompliance Nausea Face pain 2/10 Left arm pain 3/10 Smoker	Failed swallow screen Left-sided facial droop Left arm and leg weakness Hypertension Abnormal NIH stroke scale	Elevate HOB Request Speech Therapy Provide suction at the bedside Administer prn antihypertensive medication Notify HCP Frequent VS and Neuro checks	MRI reveals Right cerebellar infarct Not a surgical candidate Admitted to ICU with treatment of cerebral edema with Hypertonic Saline Discharged to a rehabilitation facility
Module 3	66 YO female Chest Pain	Exertional "squeezing" mid-chest pain Radiation to the left arm On BP medication Exacerbation of chest pain in a cold environment	Previous smoker CP 5/10 Dyspnea on exertion	Elevated BP	None	The pain did not recur Augment management of preexisting HTN and hypercholesterolemia with beta-blocker and statin ASA 81mg PO QD Continue HCTZ 25mg PO QD

						Encourage lifestyle modification such as decrease intensity of aerobic exercise for the next 3 months and d'c alcohol for the next 2 months after starting a statin Follow up in 3-4 weeks
Module 4	19 YO male Seizure	A/O x 1 Seizure precautions Tachycardia Toxicology pending LOC Strict bed rest	Does not take any meds Does not use recreational drugs 10-minute seizure Does not consume alcohol	Tachycardia A/O to self only 18-minute seizure	**EHR** Seizure precautions: -Provide a safe environment -Put bedside rails up with seizure pads - Verify room set up with O2 -Maintain a calm environment Mark room high seizure risk -Verify bed is in the lowest position **Physical** 18-minute seizure: -Report to HCP an increase in seizure duration - Place in the rescue position - Document time and duration of seizure -Administer prn anti-convulsant med A/O to self: -Report to HCP any decline in neuro status	Admitted for further testing Dx with focal onset impaired awareness seizure Started on Valproate Sodium Recommend not to switch brands of medication unless approved by HCP Discharged home with follow up appointments with his neurologist for drug monitoring and education on seizure triggers and prevention

Appendix C

Letters of Support

August 18, 2020

Dr. Lisa Shiver
Nursing Program Chair
301 Lake Condy Rd.
Opelika, AL 36801

RE: Permission to Conduct Research Study

Dear Dr. Shiver,

I am writing to request permission to conduct a research study at your institution, Southern Union State Community College. I am currently enrolled in the Doctor of Nursing Practice program at Jacksonville State University in Jacksonville, AL, and I am in the process of writing my DNP project. The study is entitled *Differences in Student Perceptions and Learning Satisfaction with Virtual Clinical Simulation.*

I hope the school administration will allow me to recruit final semester nursing students enrolled Fall 2020 to anonymously complete a questionnaire and Likert Scale. Participation would be voluntary and no identifiable information would be gathered. There would be no affiliation with the student's participation/response and their grades from Southern Union State Community College.

If approval is granted, student participants will complete the survey online from an off-campus location. The survey process should take no longer than 10 minutes to complete. The survey results will be pooled for the DNP project and individual results of this study will remain absolutely confidential and anonymous. Should this study be published, only pooled results will be documented. No costs will be incurred by either your school or the individual participants.

Your approval to conduct this study will be greatly appreciated. Please indicate approval with your signature below.

Sincerely,

Melissa Rogers Wheeles, MSN, FNP-BC
Nursing Instructor, Southern Union State Community College
DNP student, Jacksonville State University

Approved by: 

Date: 8/19/20

August 18, 2020

Dean Rhonda Davis
Nursing Program Dean
Southern Union State Community College
301 Lake Condy Rd.
Opelika, AL 36801

RE: Permission to Conduct Research Study

Dear Dean Davis,

I am writing to request permission to conduct a research study at your institution, Southern Union State Community College. I am currently enrolled in the Doctor of Nursing Practice program at Jacksonville State University in Jacksonville, AL, and I am in the process of writing my DNP project. The study is entitled *Differences in Student Perceptions and Learning Satisfaction with Virtual Clinical Simulation.*

I hope the school administration will allow me to recruit final semester nursing students enrolled Fall 2020 to anonymously complete a questionnaire and Likert Scale. Participation would be voluntary and no identifiable information would be gathered. There would be no affiliation with the student's participation/response and their grades from Southern Union State Community College.

If approval is granted, student participants will complete the survey online from an off-campus location. The survey process should take no longer than 10 minutes to complete. The survey results will be pooled for the DNP project and individual results of this study will remain absolutely confidential and anonymous. Should this study be published, only pooled results will be documented. No costs will be incurred by either your school or the individual participants.

Your approval to conduct this study will be greatly appreciated. Please indicate approval with your signature below.

Sincerely,

Melissa Rogers Wheeles, MSN, FNP-BC
Nursing Instructor, Southern Union State Community College
DNP student, Jacksonville State University

Approved by: Rhonda Davis

Date: 08-18-20

August 18, 2020

President Todd Shackett
Southern Union State Community College
301 Lake Condy Rd.
Opelika, AL 36801

RE: Permission to Conduct Research Study

Dear President Shackett,

I am writing to request permission to conduct a research study at your institution, Southern Union State Community College. I am currently enrolled in the Doctor of Nursing Practice program at Jacksonville State University in Jacksonville, AL, and I am in the process of writing my DNP project. The study is entitled *Differences in Student Perceptions and Learning Satisfaction with Virtual Clinical Simulation.*

I hope the school administration will allow me to recruit final semester nursing students enrolled Fall 2020 to anonymously complete a questionnaire and Likert Scale. Participation would be voluntary and no identifiable information would be gathered. There would be no affiliation with the student's participation/response and their grades from Southern Union State Community College.

If approval is granted, student participants will complete the survey online from an off-campus location. The survey process should take no longer than 10 minutes to complete. The survey results will be pooled for the DNP project and individual results of this study will remain absolutely confidential and anonymous. Should this study be published, only pooled results will be documented. No costs will be incurred by either your school or the individual participants.

Your approval to conduct this study will be greatly appreciated. Please indicate approval with your signature below.

Sincerely,

Melissa Rogers Wheeles, MSN, FNP-BC
Nursing Instructor, Southern Union State Community College
DNP student, Jacksonville State University

Approved by: 

Date: August 18, 2020

Appendix D

Please use the following guidelines to complete **Daily Self Performance (DSP)**

Human Flourishing (Patient-Centered Care)

- Support patients and families in ways that promote their self-determination, integrity, and ongoing growth as human beings.

- Distinguish the patient or designee as the source of control and full partner in providing compassionate and coordinated care based on respect for the patient's preferences, values, and needs

Nursing Judgment (Safety, Informatics)

- Question judgments in practice, substantiated with evidence, that integrate nursing science in the provision of safe, quality care and that promote the health of patients within a family and community context.

- Incorporate information and technology to communicate, manage knowledge, mitigate error, and support decision-making.

- Minimize risk of harm to patients and providers through both system effectiveness and individual performance

Professional Identity (Nursing Professionalism, Teamwork & Collaboration)

- Demonstrate one's role as a nurse in ways that reflect integrity, responsibility, ethical practices, and an evolving identity as a nurse committed to evidence-based practice, caring, advocacy, and safe, quality care for diverse patients within a family and community context.

- Integrate effectively within nursing and inter-professional teams, fostering open communication, mutual respect, and shared decision-making to achieve quality patient care

Spirit of Inquiry (Quality Improvement / Evidence-Based Practice)

- Apply the evidence that underlies clinical nursing practice to challenge the status quo, question underlying assumptions, and offer new insights to improve the quality of care for patients, families, and communities.

- Incorporate data to monitor the outcomes of care processes and use improvement methods to design and test changes to continuously improve the quality and safety of health care systems

- Integrate best evidence-based practice with clinical expertise, patient/family preferences, and values for delivery of optimal health care

Clinical Date: *(Question 1 of 4 - Mandatory)*

06/09/2020

(Question 2 of 4 - Mandatory, Question to be answered by Grader)

	Unsafe practice	Below expectations, needs remediation	Met expectations	Exceeded expectations	Comment Mandatory if You Select Unsafe Practice or Below Expectations, Needs Remediation
	0	**1**	**2**	**3**	
Human Flourishing	0.0	1.0	>> X <<	3.0	
Nursing judgment	0.0	1.0	>> X <<	3.0	
Professional Integrity	0.0	1.0	>> X <<	3.0	
Spirit of Inquiry	0.0	1.0	>> X <<	3.0	

Give specific examples of how you demonstrated each of the following competencies during today's clinical rotation: *Use guidelines provided above*. (All Fields Mandatory)

(Question 3 of 4 - Mandatory)

	Student Comments
Human Flourishing	I showed human flourishing by teaching my patient about the risk factors for strokes and teaching prevention of another one. I would have educated her on smoking cessation, a cardiac and low sodium diet, as well as exercise.
Nursing Judgment	I used nursing judgment when noticing my patient failed her swallow test and had facial drooping. I increased the head of the bed by 30 degrees and brought suction equipment to the bedside.
Professional Identity	I used a professional identity by working well in the break-out room with my partner and also participating in discussions with my peers. I also used a professional identity by notifying the health care provider of any neuro changes for my patient.
Spirit of Inquiry	

	I used a spirit of inquiry when remembering about strokes, we learned last semester but it had faded in my memory some. An ischemic stroke is when the blood supply to the brain is blocked. A hemorrhagic stroke is when the blood vessels burst and there is bleeding in the brain.
Other	n/a

Faculty Overall Comments *(Question 4 of 4 - Mandatory, Question to be answered by Grader)*

1. Great educational talking points.
2. These are excellent ways to utilize your nursing judgment.
3. It is important to be able to collaborate with your peers.
4. I'm glad you were able to enhance your knowledge today.

Appendix E

Tool

Part V - THE NASC-CDM© SCALE ITEMS

1. I am ___ self-confident and ___ anxious in my ability to easily see important patterns in the information I gathered from the client.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

2. I am ___ self-confident and ___ anxious in my ability to identify which pieces of clinical information I gathered are related to the client's current problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

3. I am ___ self-confident and ___ anxious in my ability to see the full clinical picture of the client's problem rather than focusing in on one part of it.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

4. I am ___ self-confident and ___ anxious in my ability to recall knowledge I learned in the past that relates to the client's current problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

5. I am ___ self-confident and ___ anxious in my ability to implement the 'best' priority decision option for the client's problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

4

6. I am ___ self-confident and ___ anxious in my ability to interpret the meaning of a specific assessment finding related to the client's problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

7. I am ___ self-confident and ___ anxious in my ability to evaluate if my clinical decision improved the client's laboratory findings.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

8. I am ___ self-confident and ___ anxious in my ability to recognize the need to talk with my clinical nursing instructor to help sort-out client assessment findings.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

9. I am ___ self-confident and ___ anxious in my ability to use active listening skills when gathering information about the client's current problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

10. I am ___ self-confident and ___ anxious in my ability to assess the client's nonverbal cues.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

11. I am ___ self-confident and ___ anxious in my ability to recognize the need to review a protocol, procedure, or nursing literature to help me make a clinical decision.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

12. I am ___ self-confident and ___ anxious in my ability to decide if information given by significant other/family is important to the client's current problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

13. I am ___ self-confident and ___ anxious in my ability to use my knowledge of anatomy and physiology to interpret information I gathered about the client's current problem.

5

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

14. I am ___ self-confident and ___ anxious in my ability to act on at least one intervention I considered based on my gut-feeling or intuition.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

15. I am ___ self-confident and ___ anxious in my ability to analyze the risks of the interventions I am considering for the client's current problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

16. I am ___ self-confident and ___ anxious in my ability to recognize important information about a client problem from information I received during shift-change report.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

17. I am ___ self-confident and ___ anxious in my ability to INDEPENDENTLY make a clinical decision to solve the client's problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

18. I am ___ self-confident and ___ anxious in my ability to ask the client additional questions to get more specific information about the current problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

19. I am ___ self-confident and ___ anxious in my ability to correlate physical assessment findings with the client's nonverbal cues to see if they match or don't match.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

20. I am ___ self-confident and ___ anxious in my ability to implement one accurate intervention if the client is having an urgent problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

6

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

21. I am ___ self-confident and ___ anxious in my ability to use my knowledge of diagnostic tests, like lab results or x-ray findings, to help create a possible list of decisions I could implement.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

22. I am ___ self-confident and ___ anxious in my ability to realize the need to talk with my clinical nursing instructor or the staff nurse about interventions I am considering.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

23. I am ___ self-confident and ___ anxious in my ability to remain open to different reasons for the client's problem even though the information I gathered may point to only one reason.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

24. I am ___ self-confident and ___ anxious in my ability to ask the client's significant other/family questions to gather information about the current problem.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

25. I am ___ self-confident and ___ anxious in my ability to evaluate if the clinical decision I made influenced client satisfaction.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

26. I am ___ self-confident and ___ anxious in my ability to incorporate personal things I know about the client in order to make decisions in his or her best interest.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

27. I am ___ self-confident and ___ anxious in my ability to consider a possible intervention for

the client's problem just because it 'seems' right.

SC: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

A: 1 = Not at all; 2 = Just a little; 3 = Somewhat; 4 = Mostly; 5 = Almost totally; 6 = Totally

7

Appendix F

Survey Statement	Traditional Mean (SD)	Virtual Mean (SD)
1. I am ___ self-confident and ___ anxious in my ability to easily see important patterns in the information I gathered from the client.	4.07 (0.83)*	3.44 (0.88)*
	2.44 (0.80)	2.56 (0.70)
2. I am ___ self-confident and ___ anxious in my ability to identify which pieces of clinical information I gathered are related to the client's current problem.	4.23 (0.82)*	3.77 (0.82)*
	2.20 (0.61)*	2.50 (0.82)*
3. I am ___ self-confident and ___ anxious in my ability to see the full clinical picture of the client's problem rather than focusing in on one part of it.	3.87 (1.14)*	3.47 (0.94)*
	2.40 (0.72)	2.63 (0.93)
4. I am ___ self-confident and ___ anxious in my ability to recall knowledge I learned in the past that relates to the client's current problem.	3.93 (1.08)	3.77 (0.86)
	2.35 (0.90)	2.52 (1.09)
5. I am ___ self-confident and ___ anxious in my ability to implement the 'best' priority decision option for the client's problem.	3.83(0.89)*	3.41 (1.09)*
	2.71 (0.98)	2.89 (1.03)
6. I am ___ self-confident and ___ anxious in my ability to interpret the meaning of a specific assessment finding related to the client's problem.	3.93 (0.98)*	3.67 (1.03)*
	2.45 (0.78)	2.53 (0.88)
7. I am ___ self-confident and ___ anxious in my ability to evaluate if my clinical decision improved the client's laboratory findings.	3.87 (1.01)	3.73 (1.23)
	2.38 (0.78)*	2.79 (1.11)*
8. I am ___ self-confident and ___ anxious in my ability to recognize the need to talk with my clinical nursing instructor to help sort-out client assessment findings.	4.80 (1.03)*	4.57 (1.19)*
	1.90 (0.77)	1.93 (0.96)
9. I am ___ self-confident and ___ anxious in my ability to use active listening skills when gathering information about the client's current problem.	4.69 (0.93)	4.41 (1.32)
	1.86 (0.71)	1.96 (0.92)
10. I am ___ self-confident and ___ anxious in my ability to assess the client's nonverbal cues.	4.25 (0.84)*	3.82 (1.33)*
	2.00 (0.74)	2.27 (0.94)
11. I am ___ self-confident and ___ anxious in my ability to recognize the need to review a protocol, procedure, or nursing literature to help me make a clinical decision.	4.40 (0.97)*	4.10 (1.32)*
	2.24 (0.83)	2.14 (0.74)
12. I am ___ self-confident and ___ anxious in my ability to decide if information given by significant other/family is important to the client's current problem.	4.03 (0.78)	3.83 (1.04)
	2.28 (0.65)	2.21 (0.68)
13. I am ___ self-confident and ___ anxious in my ability to use my knowledge of anatomy and physiology to interpret information I gathered about the client's current problem.	3.93 (0.92)	3.76 (1.09)
	2.38 (0.78)	2.52 (0.83)
14. I am ___ self-confident and ___ anxious in my ability to act on at least one intervention I considered based on my gut-feeling or intuition.	3.93 (0.79)	3.87 (1.04)
	2.66 (1.17)	2.76 (0.87)
15. I am ___ self-confident and ___ anxious in my ability to analyze the risks of the interventions I am considering for the client's current problem.	3.83 (1.02)	3.70 (0.95)
	2.59 (0.68)	2.55 (0.63)
16. I am ___ self-confident and ___ anxious in my ability to recognize important information about a client problem from information I received during shift-change report.	4.21 (0.98)	4.03 (0.94)
	2.29 (0.76)	2.32 (0.91)
	3.47 (1.04)*	3.07 (0.98)*

17. I am ___ self-confident and ___ anxious in my ability to INDEPENDENTLY make clinical decision to solve the client's problem.	3.28 (1.19)	3.14 (1.16)
18. I am ___ self-confident and ___ anxious in my ability to ask the client additional questions to get more specific information about the current problem.	4.37 (0.85)	4.10 (1.00)
	2.07 (0.70)	2.10 (0.77)
19. I am ___ self-confident and ___ anxious in my ability to correlate physical assessment findings with the client's nonverbal cues to see if they match or don't match.	3.93 (0.88)	3.72 (0.96)
	2.21 (0.63)	2.36 (0.68)
20. I am ___ self-confident and ___ anxious in my ability to implement one accurate intervention if the client is having an urgent problem.	4.03 (1.07)*	3.77 (1.31)*
	2.76 (1.06)	2.59 (0.83)
21. I am ___ self-confident and ___ anxious in my ability to use my knowledge of diagnostic tests, like lab results or x-ray findings, to help create a possible list of decisions I could implement.	4.13 (0.97)	3.93 (0.87)
	2.35 (0.86)	2.24 (0.83)
22. I am ___ self-confident and ___ anxious in my ability to realize the need to talk with my clinical nursing instructor or the staff nurse about interventions I am considering. [SC]	4.70 (1.06)	4.60 (1.07)
	1.86 (0.88)	1.86 (0.64)
23. I am ___ self-confident and ___ anxious in my ability to remain open to different reasons for the client's problem even though the information I gathered may point to only one reason.	4.43 (0.94)*	4.20 (1.12)*
	2.00 (0.85)	1.96 (0.91)
24. I am ___ self-confident and ___ anxious in my ability to ask the client's significant other/family questions to gather information about the current problem.	4.31 (0.85)	4.10 (1.05)
	2.21 (0.68)	2.17 (0.85)
25. I am ___ self-confident and ___ anxious in my ability to evaluate if the clinical decision I made influenced client satisfaction.	4.17 (1.07)*	3.83 (1.26)*
	2.17 (0.76)	2.24 (0.64)
26. I am ___ self-confident and ___ anxious in my ability to incorporate personal things I know about the client in order to make decisions in his or her best interest.	4.03 (1.00)*	3.67 (0.99)*
	2.28 (0.80)	2.31 (0.76)
27. I am ___ self-confident and ___ anxious in my ability to consider a possible intervention for the client's problem just because it 'seems' right.	3.77 (0.82)*	3.43 (1.01)*
	2.55 (0.74)	2.62 (0.68)

*significant p-value at α=0.10 level.

Appendix G

Informed Consent Form

Please read this consent agreement carefully before agreeing to participate in this project.

Title of project: Differences in Student Perceptions with Virtual Clinical Simulation

Purposes of the project: The goal of this project is to determine the impact of virtual simulation clinical for nursing students and its effects on students' perceptions of anxiety and self-confidence in clinical decision making compared to traditional face-to-face clinicals.

Location of the Project: Southern Union State Community College 301 Lake Condy Rd. Opelika, AL 36801

What you will do in this study: You will complete a brief research tool regarding your perceptions of anxiety and self-confidence in clinical decision making in virtual simulation clinical compared to traditional face-to-face clinicals.

Time Required: You will be expected to spend approximately 20 minutes completing the electronic research tool.

Risks: There are not any expected risks associated with participating in this project.

Benefits: You will contribute to the collection of information regarding how virtual simulation clinical impacts nursing students. This information may lend to future curriculum development for nursing students.

Confidentiality: All information obtained from the collection of data from participants will not include any student identifiers. All individual student participants will remain anonymous by using participant identification numbers. The confidentiality of participants will be maintained by the use of password-protected electronic files with accessibility to the researcher only. The confidentiality of participants will be maintained during all parts of the study.

Participation and Withdrawal: Your participation in this project is entirely voluntary, and you may withdraw from the project at any time without penalty.

Contact: If you have any questions about this project, please contact Melissa Wheeles, mwheeles@stu.jsu.edu or (334)748-0134.

Agreement: The purpose of this project has been satisfactorily explained, and I agree to participate in this study. I understand I am free to withdraw at any time without incurring any penalty.

In signing this agreement, I also affirm that I am at least 18 years of age or older.

Name (print): _____

Signature: _____Date: _____

Appendix H

JSU | OFFICE OF THE VICE PROVOST
JACKSONVILLE STATE UNIVERSITY

October 30, 2020

Dear Melissa Wheeles:

Your proposal submitted for review by the Human Participants Review Protocol for the project titled: "Differences in Student Perceptions with Virtual Clinical Simulation" has been approved as exempt. If the project is still in process one year from now, you are asked to provide the IRB with a renewal application and a report on the progress of the research project.

Sincerely,

Joe Walsh
Executive Secretary, IRB

JW/dh

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P. 800.231.5291
F. 256.782.5541
ejwalsh@jsu.edu
www.jsu.edu

Appendix I

Timeline

Table 1

Task	October	November	December	January	February	March	April
Recruitment of eligible participants				X			
Intervention; Evaluation; Toolkit	X	X	X	X	X	X	
Post-test and Analysis of outcomes							X
Results presented to local providers							X